FINAL STATUS REPORT ON THE 2003 GREATER SANDHILL CRANE NESTING SEASON AT CONBOY LAKE NATIONAL WILDLIFE REFUGE, KLICKITAT COUNTY, WASHINGTON

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INTRODUCTION

Since 1995, the Ridgefield NWR Complex staff with the assistance of Washington Department of Fish and Wildlife (WDFW) and Yakama Indian Nation (YIN) personnel has monitored the only known breeding population of greater sandhill cranes (Grus canadensis tabida) in Washington. This breeding population was classified as endangered by the State of Washington in 1981 due to its limited range and small extant population (Washington Administration Code 232-12-014). Formerly more widespread in Washington, this subspecies is currently known to nest only on the Conboy Lake NWR within the Glenwood Valley (Klickitat County), Panakanic Valley (Klickitat County), Yakama Indian Nation lands (Yakima County), and on Department of Natural Resources land (Yakima County). The Conboy Lake NWR provides nesting habitat for approximately 85% of all known breeding cranes in Washington. For the purposes of this report, the "on-refuge" designation pertains to cranes nesting within the Glenwood Valley because all individual crane territories lie partially or entirely within the refuge boundary.

METHODS

From 1995-2003, refuge staff regularly monitored the breeding sandhill crane population in the Glenwood Valley. Survey intensity and scope has varied annually depending on funding and availability of personnel. Survey methods and intensity have also adapted over the years based on accumulated knowledge of nesting pairs and territories, efficiency of data collection, and shifting data priorities. Surveys are initiated in March to determine arrival dates for breeding pairs, family groups and non-breeding sub-adults. Surveys increase from mid April to early May to determine nest initiation dates, locate nesting sites, and delineate territories. This information is critical for late season production surveys and banding operations. These early surveys also provide wetland information which is utilized to manipulate wetland water levels geared toward reducing potential flooding or drying impacts to crane nests. Surveys increase in early July to locate colts (chicks) for banding. Late season surveys are conducted in September to verify fledging and survival of colts, as well as mapping critical foraging habitat for colt rearing. These latter surveys are crucial for estimating annual production. Incidental observations are catalogued throughout the season to periodically verify nesting status, colt survival and delineate the non nesting population. Most surveys are conducted from sunrise to noon and early evening to sunset, when cranes are most active.

Off-refuge sites are monitored 1-2 times per season through multi-agency aerial surveys. The aerial flights focus on established territories but diversions to examine potential nesting meadows are conducted if weather and flight budgets allows. Helicopter reconnaissance is also utilized to verify new-sighting reports from WDFW and YIN ground personnel and volunteers.

During July, Refuge staff and volunteers color-band crane colts that have survived to 8 weeks of age. Each leg-banded crane receives a unique color combination to identify its origin (Conboy Lake NWR) and its individuality. Subsequent sightings are utilized to determine colt survival, migration and wintering areas, site fidelity, dispersal, breeding territory establishment and reproductive status, and non-territory foraging behavior.

All survey data, incidental crane observations, and band-recoveries are entered into a database established at the Ridgefield National Wildlife Refuge headquarters. This data includes date, time observed, number observed, band information, activity, and specific location. All locations are entered into a GIS database and mapped utilizing the Universal Transverse Mercator grid system. This mapping system will allow for future delineation and analysis of crane territories.

RESULTS

During the 2003 season, there were approximately 499 observation-records of cranes (singles, families or flocks). These observations totaled 976 adults and 86 colts. Eighty-three percent of these observations were of single birds or pairs, which represent the breeding cohort of this population. Sightings of single foraging cranes in established territories are indicative of nest incubation for that pair. There were a total of 129 observations of 8 color-banded cranes in the Glenwood Valley.

Conboy Lake NWR/Glenwood Valley

The first spring arrivals returning to Conboy Lake were documented on 12 March 2003. Cranes have been observed to arrive at breeding sites in late February (Engler and Brady 2000); however, most cranes appear to arrive during March. In general, territorial pairs (with or without previous years colts) arrive earlier in the month than sub-adults (>1 years old, non-breeders). Based on data from color-banded birds, previous-season's young are known to migrate north with their parents but are usually displaced from the adult territory within a week. This pattern of familial migration has been described by Walkinshaw (1949). Established pairs usually return immediately to their nesting territories upon arrival.

The first observation of nest incubation occurred on 8 April. Fifteen confirmed nesting pairs were observed this year; two additional territorial pairs were observed but surveys were insufficient to document nesting. Eleven of the 15 confirmed nests were known to have hatched, while one nesting pair was known to have failed from drying wetland conditions. Insufficient data was collected to determine hatching success on the other 3 nests. In addition, 2 re-nests occurred of which one hatched and one contained an infertile egg. It could not be definitively determined as to which pairs re-nested. However, it is likely that they were the two previously failed pairs from the Willard wetland, as one re-nest occurred within the same wetland, while the second was established in an adjacent unoccupied wetland. Both pairs utilized similar foraging territories as the Willard pairs.

This year, ten of the fifteen nesting pairs hatched at least twelve colts. Given the fact that cranes generally lay two eggs, it is likely that hatching numbers were higher. However, typically one colt disappears shortly after hatching due to predation, siblicide, or other environmental factors; survey frequency is insufficient to document this mortality. The first colt was observed on 16 May and was estimated to have hatched between 7-13 May. The last nest (a re-nesting attempt) was estimated to have hatched on 9 June based on the observation of one very young colt. Seven colts were known or suspected of reaching flight stage. One fledged chick was found dead on 19 August, apparently from striking a power line. Five fledged colts were observed into late August or September and assumed to have migrated south. There were no observations of one banded colt (or its parents) since the colt was banded on 16 July. The few late season surveys conducted may have been inadequate to determine the true status of this bird. For reporting purposes, it is assumed that this bird did not survive. Production estimates will be amended should this banded bird be re-sighted in 2004.

The last recorded sighting of cranes in the Glenwood Valley occurred on 25 September, with an additional report in early October. Typically, a few cranes linger into late September or early October before migrating south. The breeding population is expected to migrate south at approximately the same time, and follow the eastern slope of the Cascade Range, though there is no data verifying this assumption. Northern breeding cranes from Canada and Alaska are not known to migrate through this area.

Table 1 summarizes the population estimate, number of breeding pairs, and production in Washington from 1992-2003. A summary of population estimates and production prior to 1992 can be found in a previous report (Anderson 1995).

TABLE 1. Sandhill Crane: Breeding Pairs and Production in Washington, 1992-2003

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
WA Population Estimate A	6	6	8	22	26	34	39	40	47	50	50	49
#Breeding Pairs On-Refuge ( )B	3	3	3	7 (2)	8 (2)	12	14	13 (1)	13 (3)	14 (2)	11 (5)	15 (2)
#Breeding Pairs Off-Refuge ( ) B			1	1 (1)	2 (1)	3	(3)	3 (1)	2 (1)	2 (2)	2 (2)	3 (1)
#SubAdult (non-breeders) On-Refuge				0	0	4	5	4	9	10	10	7
# Young Produced*	3	0	0	1	3	5	5	5	6	0	2	5

1992-1994 data is based on incidental observations; the numbers presented are unconfirmed estimates.

A – data includes confirmed pairs, unconfirmed pairs, and sub-adults but does not include young fledged that year
B – data in parentheses represent territorial pairs without confirmed nesting data

"On-refuge" refers to cranes nesting within the Glenwood Valley
"Off-refuge" refers to cranes nesting outside the Glenwood Valley
* - this number reflects young known or suspected of joining the fall migration

Helicopter Surveys and Off-Refuge Surveys

Two helicopter surveys were funded by the Washington Department of Fish and Wildlife this season.

The first helicopter survey was conducted on 21 May 2003. The flight covered the Glenwood Valley, Department of Natural Resources land (DNR), Yakama Indian Nation lands, and the Panakanic Valley. In addition to known nesting areas, the flight included several wetlands around South Mt. Adams Lake, where cranes had been heard in previous weeks.

Within the Glenwood Valley, the flight located 13 nests from 8 pairs (which included multiple abandoned nests within the same territory) and 3 pairs with 4 colts. At the Deer Creek site on DNR land, one nest was observed with 2 eggs. At the Polo Fields on Yakama Indian Nation lands, 2 nests with 2 eggs each were observed. No cranes were observed in the South Mt. Adams Lake wetland system, though this extensive wetland appears to have potential for supporting multiple breeding territories. No birds were observed in the Panakanic Valley, though incidental ground surveys prior to the flight indicated that cranes were present early in the season. Low water conditions in the Panakanic Valley may have precluded any nesting attempts this year.

The second helicopter survey was conducted on 25 June 2003 and covered the Glenwood Valley, DNR lands and YIN lands. The Deer Creek pair was observed and exhibited broody behavior. However, a subsequent ground survey revealed that this pair was unsuccessful in fledging young. One of the pairs was observed at the Polo Fields, also exhibiting broody behavior and it is suspected that this pair may have been rearing a colt. The fledging status of the Polo Field pairs is unknown. Incidental observations by YIN personnel indicated crane activity in the vicinity of the Camas Patch, a meadow formerly occupied by nesting cranes (King, pers. comm.). This area appears marginal for nesting due to uncertain water supplies and cattle grazing, but could probably be restored into a viable nesting meadow.

At least one March sighting of cranes occurred at Trout Lake Marsh where sporadic sightings have occurred since 2000. Although the marsh seems to have a high potential for attracting nesting cranes, there is insufficient data to determine if any nesting territories have been established.

Two color-banded male cranes were not observed this season. One crane, banded in 1999, had been observed in the Panakanic Valley during 2001-2002; the other had been banded in 2000 and returned to the refuge in 2001 and 2002.

Color-banding Project

The color-banding project was initiated in 1996 and targets pre-fledged colts. These young birds are monitored until they reach approximately 8 weeks of age, which is approximately one week before they attain flight (fledging). A ground crew then captures the colt for banding. All cranes banded at Conboy Lake receive a blue/white/blue site band and a uniquely numbered U.S. Fish and Wildlife Service band on one leg. On the opposite leg, a unique 2-color combination of bands is used to identify the individual bird. Immediately after banding, colts are monitored until they rejoin the family group.

Three colts were banded in 2003. The Arena colt was banded on 9 July with a blue over white identifier band. This bird was expected to have migrated south in the fall. On 16 July, the Myers and the Conboy Lake colts were banded with black/green and white/green bands, respectively. It is unknown if the latter colt survived to fledging stage, as post-banding surveys failed to re-locate the family group.

A total of 20 crane colts have been color-banded on the refuge since 1996. Six of these were suspected of not having survived to the fall migration, while one colt from this season is unknown. From 1996-2003, banded colts comprised 42% of the total recruitment. Of the 11 banded colts (pre-2003) that migrated in the fall, 10 subsequently returned to the Glenwood Valley the following season. The last bird, though not observed in Washington during the spring, was observed the following fall in California. These observations are consistent with other information indicating that second-year sub-adults return to their natal grounds as a family group. In subsequent years, males are generally expected to return to their natal area to breed, while females often leave the natal grounds. Banding data at Conboy Lake supports this information.

Since 1996, 7 banded male cranes (based on size and behavior) have returned to the Glenwood Valley as third year or older birds. Three of these birds have nested while three others have formed pair bonds. A banded female crane has been nesting on the Mt. Hood National Forest in Oregon since 2000, while a banded female paired with a banded male and nested unsuccessfully at Conboy Lake in 2003. Two banded males (> 2 years old) were not re-observed this season.

As follows are summaries of re-sightings and the status of color-banded colts, by unique band color code.

A. Red/Green (hatch territory: Arena) was banded on 6/26/96. It was observed near the town of Glenn, Glenn County, CA on 14 January 1997. It returned as a non-breeder to Conboy Lake NWR during 1997. This male crane returned to Conboy Lake NWR as a breeder from 1998 2003; so far, it has been unsuccessful in fledging young.

B. Black/White (hatch territory: Arena) was banded on 6/26/96 and is the sibling of Red/Green. It was observed near the town of Glenn, Glenn County, CA on 14 January 1997. It returned as a non-breeder to Conboy Lake NWR during 1997. This male crane returned to Conboy Lake NWR as a breeder from 1998-2003; so far, it has been unsuccessful in fledging young. This bird was observed on Staten Island, San Joaquin County, CA on 4 November 2002 (Herziger, pers. comm.) and at the Butte Valley Wildlife Area, Siskiyou County, CA on 7 March 2003 (Novick, pers. comm.).

C. White/Red (hatch territory: Myers) was banded on 7/16/97. It returned to Conboy Lake as a non-breeder in 1998. It was subsequently observed during the fall migration on 29 September 1998 at Lower Klamath NWR, Siskiyou County, CA (Beckstrand, pers. comm.). It was not observed in 1999. This female crane was observed paired with an unmarked bird on 22 May 2000 on the Camas Prairie in the Mt. Hood National Forest, Wasco County, OR. (Gould, pers. comm.) This bird's color-band code was later verified by G. Ivey on 6 June 2000; nesting was not confirmed. This pair was observed on 6 April 2001 at the Camas Prairie by J. Engler.

Nesting was confirmed in 2001 when the pair was observed with two colts on 20 May (Gould, pers. comm.); fledging is unknown but the timing suggests that fledging (1 colt) was likely. This pair successfully fledged 2 colts in 2002 and 1 colt in 2003 (Gould, pers. comm.). The pair was observed approximately 8.5 miles east of their breeding meadow at Smock Prairie, Wasco County, OR on 30 April 2003 (Thompson pers. comm.).

D. Green/White (hatch territory: Miller) was banded on 7/16/97. It returned as a non-breeder in 1998 and it was subsequently observed during the fall migration on 29 September 1998 at Lower Klamath NWR, Siskiyou County, CA (Beckstrand, pers. comm.). It was re-observed at Conboy Lake NWR only once per season in both 1998 and 1999. It has not been observed since 1999. It is believed to be a male.

E. White/Blue (hatch territory: Arena) was banded on 7/2/98. It returned as a non-breeder in 1999 and was observed on 14 November 1999 along Woodbridge Road in San Joaquin County, CA. It returned paired with an unbanded bird to Conboy Lake NWR in 2000. Nesting was likely in 2000 but not confirmed. This pair nested in 2001-2002-2003 but has not successfully fledged young. This bird was observed at Staten Island, San Joaquin County, CA on 16 December 2001 (unknown observer).

F. Green/Black (hatch territory: Dean Meadow) was banded on 7/6/99. It returned as a non breeder to Conboy Lake NWR during 2000. It did not exhibit any noticeable signs of a leg injury it sustained prior to the fall 1999 migration. This male crane was observed periodically in the Panakanic Valley and at Conboy Lake during 2001 accompanied by the 2000 banded colt Blue/Red. It was re-observed in the Panakanic Valley in 2002 and assumed nesting with Blue/Red but nesting was not confirmed. This bird was not observed in 2003.

G. Black/Red (hatch territory: Arena) was banded on 7/6/99. It did not return to Conboy Lake NWR in 2000 or thereafter. However it was observed at Butte Sink NWR, Sutter County, CA on 3 November 2000. It was observed again on 10 January 2003 at Tyler Island, San Joaquin County, CA and on 13 January 2003 at Staten Island, San Joaquin County, CA (Herziger pers. comm.).

H. Green/Red (hatch territory: Arena) was banded on 7/11/00. It returned to Conboy Lake NWR during 2001 and 2002 as a non-breeder. In 2003, this male returned to Conboy Lake paired with female Blue/Red; they did not nest successfully.

I. Green/Blue (hatch territory: Arena) was banded on 7/11/00 and is the sibling of Green/Red. It returned to Conboy Lake NWR in 2001 and 2002 as a non-breeder. It is believed to be a male. This bird was not observed in 2003.

J. White/Black (hatch territory: Myers) was banded on 8/11/00. It returned to Conboy Lake NWR in 2001-2002 as a non-breeder. It returned paired in 2003 but did not appear to nest. It is believed to be a male.

K. Blue/Red (hatch territory: C&H) was banded on 7/18/00. It returned to Conboy Lake NWR in 2001 and 2002 as a non-breeder, spending much of its time in the Panakanic Valley with Green/Black. This female returned in 2003 paired with Green/Red but did not successfully nest.

DISCUSSION

This season marks the ninth year of comprehensive data collection on the refuge's nesting sandhill crane population with additional data collected for off-refuge crane nesting. This work is believed to encompass all of the current nesting by greater sandhill cranes in Washington. Over the years, this project has documented crane nesting sites and habitat use, individual pair production, breeding season time frames, territory data, migration and wintering sites, site fidelity, and juvenile survival.

Data indicates that the greater sandhill crane nesting population in Washington is currently stable or slightly increasing. However, population growth has been relatively low since 1997, as the population has increased by only 6 pairs, despite the recruitment of 27 young into the population from 1995-2002. Assessing this low population growth, particularly within the Glenwood Valley, is further confounded by: 1) the presence of a disproportionate number of males in the sub-adult population, 2) the continued failure of several banded breeding age pairs to establish firm territories, and 3) the 2003 disappearance of two banded breeding age males from the local population. The inability to co-manage water adequately for crane nesting on contiguous tracts of refuge and private lands is believed to be a primary reason for territory failure. A crane pair's inability to retain an established territory may lead to a decrease in territory quality over time as these pairs are unable to benefit from changes that occur in neighboring territories, namely the ability to usurp all or key portions of these neighboring territories (Nesbitt and Tacha 1997). The cyclic availability of adequate nesting and foraging habitat, as observed in the Glenwood Valley, may lead to territory abandonment and mate desertion. This low population growth within the Glenwood Valley coupled with the increase in off-refuge sightings in recent years would suggest that cranes are not locating stable nesting territories and thus attempting to pioneer new areas outside of the Glenwood Valley.

Current surveys are inadequate to address this potential pioneering as off-refuge expansion sites are difficult to access and occur mostly on tribal and private lands. Further, refuge funds have dwindled considerably in recent years, barely allowing for continued monitoring of the refuge population. Long-term monitoring and this accumulated history on established pairs and territories facilitate the collection and analysis of data for these established crane territories. However, the current level of monitoring has been insufficient in recent years to delineate the breeding status and territory affiliations of 'new pairs' and re-nest attempts. This has reduced the ability to accurately estimate the number of breeding pairs and recruitment within the Glenwood Valley, as well as estimating the Washington population overall.

In order to fulfill the objectives of the Washington State Sandhill Crane Recovery Plan (Littlefield and Ivey 2002), it is imperative to increase the monitoring of these potential expansion sites and evaluate habitat conditions and productivity. A satellite telemetry project would enable the collection of data on seasonal movements and dispersal patterns of sub-adults. A telemetry project could also serve to identify areas utilized by pioneering cranes, thus focusing searches for new breeding territories.

ACKNOWLEDGEMENTS

We would like to thank the following people for their field monitoring efforts, flight assistance and banding assistance during the 2003 Greater Sandhill Crane Project at Conboy Lake NWR:

Brook Beeler, AmeriCorps
Harold E. Cole, Conboy Lake National Wildlife Refuge
Maggie Gould, Mt. Hood National Forest
Gina King, Yakama Indian Nation
Sara McFall
Lauren Ridenour, Ridgefield National Wildlife Refuge Complex
Youth Conservation Corps, Glenwood, Washington

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End Crane Report 2003